PATENT SPECIFICATION

678,906

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COMPLETE SPECIFICATION

Improvements in and relating to Light Projectors

We, THE BRITISH THOMSON-HOUSTON COMPANY LIMITED, a British company having its registered office at Crown House, Aldwych, London, W.C.2, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement :—

Our invention relates to light projectors, and more particularly to cooling means for floodlighting projectors and the like.

It is a general object of our invention to provide means for appreciably increasing the energy output and wattage rating of light projectors, such as floodlights and the like, without increasing their physical size.

It is another object of our invention to provide new and improved air recirculating and cooling means for floodlight projectors and the like.

It is a still further object of our invention to provide new and improved means for evenly distributing generated heat in a floodlight projector and the like, thereby to minimize critical hot spots and permit an increase in rating.

Our invention itself will be more fully understood and its various objects and advantages further appreciated by referring now to the following detailed specification taken in conjunction with the accompanying drawing, wherein Fig. 1 is a side elevational view, partly in section, of a floodlight projector embodying our invention ; Fig. 2 is a fragmentary end elevational view of the projector shown at Fig. 1 ; and Fig. 3 is a cross-sectional view taken along the line 3–3 of Fig. 1.

Referring now to the drawing in detail, we have shown a light projector comprising a divergent main reflector 1 having a mounting collar 2, a cup-shaped socket housing 3 fixed to the mounting collar, and an air recirculating conduit *4* externally connecting the reflector 1 with the interior of the collar 2. The entire projector is pivotally mounted between the side arms of a mounting yoke 5 by means of oppositely disposed trunnions 2*a* projecting from the sides of the collar 2.

Apart from the air recirculating conduit *4*, the light projector shown in the drawing is generally similar to that described in Patent Specification No. 595,397. The main reflector 1 is generally conoidal in shape, having a narrow eccentric neck portion 1*a* and diverging toward a wide mouth portion 1*b*. The mouth portion of the reflector is closed by a cover glass 6. The collar 2 is connected at one end to the neck portion 1*a* of the main reflector and closed at its other end by the socket housing 3. The socket housing 3 is provided with a lamp socket 7, and the mounting collar 2 serves to encase the neck portion of an incandescent lamp 8 mounted in the socket 7. In the illustrated embodiment of the invention, the axis of the mounting collar 2 is disposed at an obtuse angle with respect to the axis of the conoidal main reflector 1. The main reflector 1, collar 2 and socket housing 3 together thus constitute a closed casing which may be generally regarded as including a main reflector compartment on one side of the reflector neck 1*a*, and a socket compartment on the other side.

Interiorly of the projector casing, and in the region of the main reflector neck portion 1*a*, there is mounted a ring-shaped auxiliary reflector 9 which extends generally across the neck portion of the main reflector and serves as a dividing wall between the main reflector compartment and the socket compartment. The auxiliary reflector is centrally apertured to accommodate the neck of the lamp 8, which extends from the socket 7, through collar 2 and the auxiliary reflector 9, into the main reflector compartment. The ring-shaped auxiliary reflector 9 is radially spaced from the neck 1*a* of the main reflector 1, thereby to permit passage of air from the socket compartment into the main reflector compartment ; and the auxiliary reflector is so shaped that air passing from the socket

[*Price 2s. 8d.*]

compartment into the main reflector compartment is directed into intimate contact with the bulb portion of the lamp 8 and the closely adjacent main reflector areas. The reflector 9 is supported upon a plurality of mounting brackets 10 fixed upon bosses 11 on the socket housing 3.

Externally of the closed casing constituted by the main reflector 1, the collar 2, and the socket housing 3, we provide an air cooling and return conduit *4* including a finned recirculating pipe 12 and a fan housing 13. This air cooling conduit *4* is connected between the mouth portion 1*b* of the main reflector 1 and the tubular mounting collar 2. The recirculating pipe is connected at one end to the mouth portion 1*b* of the main reflector and at the other end to the inlet side of the fan casing 13. The outlet side of the fan casing is connected to the collar 2 at the side thereof, thereby to introduce air transversely into the socket compartment and in a direction substantially perpendicular to the neck of the lamp 8, i.e., radially.

The recirculating pipe 12 is provided both interiorly and exteriorly with cooling fins 12*a*, and is divided longitudinally into two sections which are bolted together in the manner indicated at Fig. 3.

Within the fan housing 13 there is disposed a centrifugal blower 14 driven by a motor 15. The blower 14 draws air from the recirculating pipe 12 and exhausts it into the socket compartment through the collar 2, so that air is continuously circulated from the socket compartment into the main reflector compartment and back through the air cooling conduit *4*. Air traversing this closed path is cooled in the recirculating pipe 12 and introduced into the socket compartment transversely across the neck of the lamp 8. The air is then directed by the auxiliary reflector 9 into the main reflector compartment in intimate contact with the bulb portion of the lamp 8 and the narrow reflector portion near the reflector neck. The air heated up in its passage through the socket and main reflector compartments is exhausted from the main reflector compartment into the recirculating pipe 12 for recooling. By this arrangement, the coolest air is introduced into the hottest part of the projector casing, and is directed by the auxiliary reflector 9 into the most useful path in its passage through the casing. The air thus passing at considerable velocity through the closed projector casing serves to evenly distribute the heat within the casing, thereby minimizing the generation of critical hot spots in the projector. Moreover, the cooling is done by means of recirculated air, so that the entire system is sealed and closed to the atmosphere. This prevents the accumulation within the reflector casing of dust and dirt which would otherwise rapidly decrease the light projection efficiency of the unit.

While we have described a preferred embodiment of our invention by way of illustration, many modifications will occur to those skilled in the art.

WHAT WE CLAIM IS :—

1. A light projector comprising a closed casing provided with a divergent reflector having a narrow neck portion and a wide mouth portion, and means including an external conduit connecting the neck and mouth portions for forcibly circulating air within the casing.

2. A light projector comprising a divergent reflector having a narrow neck portion and a wide mouth portion provided with a light transmitting cover, enclosure means including a lamp socket housing and providing a socket compartment externally adjacent to the neck portion, the reflector and enclosure means constituting a closed projector casing, a cooling conduit external of the projector casing and connecting the mouth portion of the reflector with the socket compartment, and means for forcibly recirculating air through the conduit and casing.

3. A light projector as claimed in claim 1 or 2 a divergent reflector having a narrow neck portion and a wide mouth portion in which a circulating fan is mounted in the conduit for forcibly recirculating air in a closed path through the conduit and casing, said fan introducing air into the neck port in a direction substantially perpendicular to the axis of a lamp mounted in the neck portion of the projector.

4. A light projector comprising a divergent main reflector having a narrow neck portion and a wide mouth portion provided with a light transmitting cover, enclosure means including a lamp socket housing and providing a socket compartment externally adjacent to the neck portion of the main reflector, the main reflector and enclosure means constituting a closed projector casing, means including an air conduit external to the casing for circulating air in a closed path from the socket compartment to the mouth portion of the reflector and back through the conduit, and an auxiliary reflector mounted interiorly of the casing across the neck portion of the main reflector, the auxiliary reflector being apertured to accommodate the neck of a lamp mounted in the socket housing and being shaped to direct air from the socket compartment into the main reflector in intimate contact with the lamp and main reflector.

5. A light projector as claimed in claim 4 in which the auxiliary reflector is centrally apertured to accommodate the neck of a lamp extending through the socket compart-

ment and into the main reflector compartment and being shaped to direct air from the socket compartment into the main reflector compartment in intimate contact with the lamp.

6. A light projector comprising a conoidal main reflector having a narrow neck portion and a wide mouth portion provided with a light transmitting cover, a tubular mounting collar fixed to the neck portion of the main reflector with the axes of the collar and main reflector relatively angularly disposed, a cup-shaped socket housing fixed to the collar and providing with the collar and main reflector a closed projector casing, a ring-shaped auxiliary reflector mounted interiorly of the casing across the neck portion of the main reflector and dividing the casing into a main reflector compartment and a socket compartment, the auxiliary reflector being centrally apertured to accommodate the neck of a lamp mounted in the socket housing and extending into the main reflector compartment and being shaped to direct air from the socket compartment into the main reflector compartment in intimate contact with the lamp, an air cooling conduit external to the casing connecting the mouth portion of the main reflector with the mounting collar, the cooling conduit being connected to the collar to introduce air into the socket compartment in a direction substantially perpendicular to the neck of the lamp, and an air circulating fan mounted in the conduit to circulate air from the socket compartment into the main reflector compartment and back through the cooling conduit.

7. A light projector constructed substantially as hereinbefore described with reference to the accompanying drawings.

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678,906 COMPLETE SPECIFICATION
1 SHEET

This drawing is a reproduction of the Original on a reduced scale.

FIG. 2.

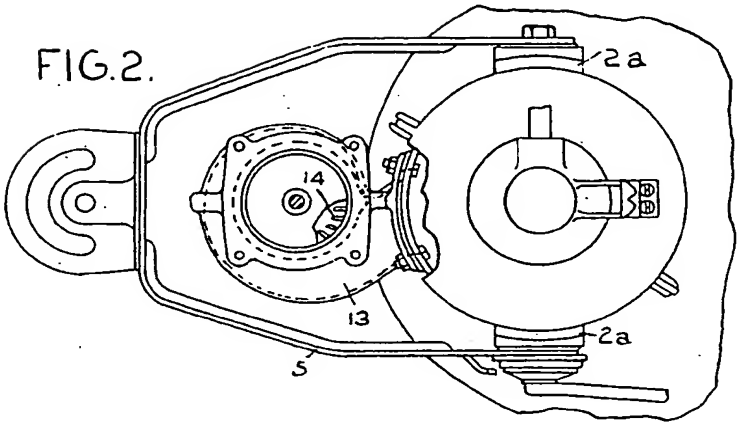

FIG. 1.

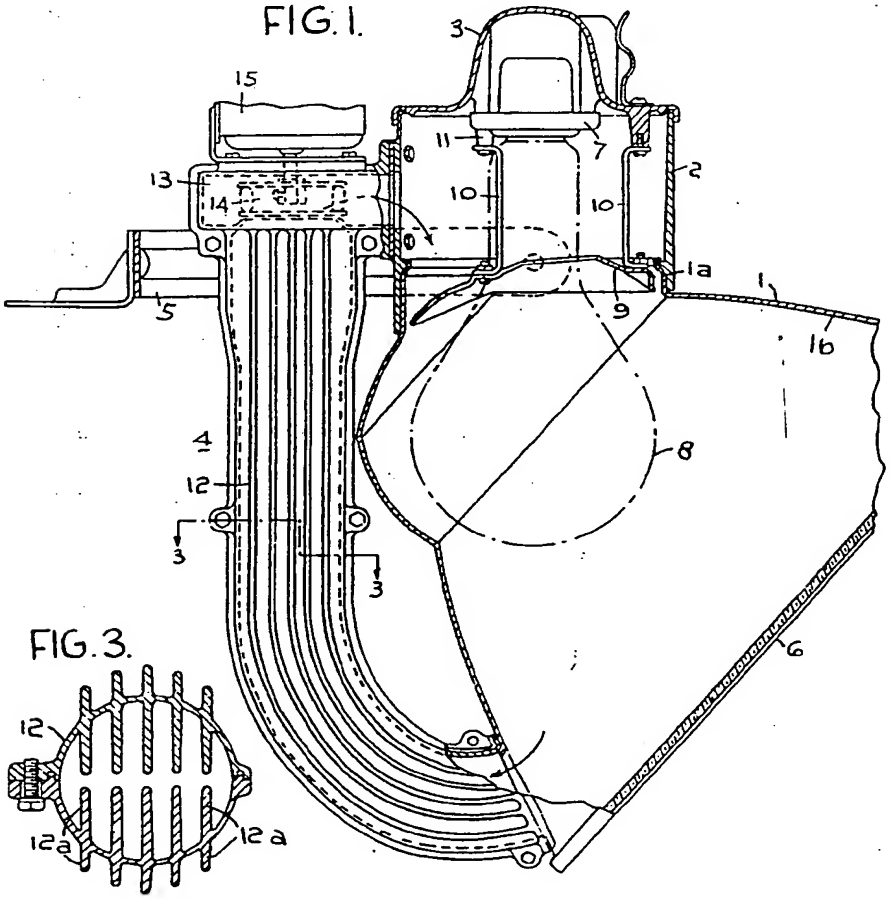

FIG. 3.